European Patent Application

Sony International (Europe) GmbH

"SOVA Turbo Decoder with decreased normalisation complexity"

S99P5104EP00/PAE99-065TRDE

5   P22888

Claims:

1. Turbo decoder with at least two effective decoding units using a soft output Viterbi
10 algorithm,

wherein outputs of the decoding units (25, 26) are normalized by means of

normalization units 27),

characterized in that

only a subset (25) of the decoding units of the turbo decoder (34) is provided with a

15 normalization unit (27) at its output side.

2. Turbo decoder according to claim 1,

characterized in that

only decoding units (30) being provided with a normalized output of a preceding

20 decoding unit (25) are not provided with normalization units at their output side.

3. Turbo decoder according to claim 1 or 2,

characterized in that

it comprises two decoding units (25, 30), wherein only the first decoding unit (25) is

25 provided with a normalization unit at its output side.

4. Mobile communications device,

characterized in that

it comprises a turbo decoder (34) according to anyone of the preceding claims 1.

30

5. Turbo decoding method using a soft output Viterbi algorithm,

wherein a plurality of effective decoding units (25, 30) are used and outputs of the

decoding units (25, 30) are normalized (27) with a normalization factor,

characterized in that

only a subset (25) of the decoding units of the turbo decoder is normalized with a normalization factor variable during operation and the other decoding unit(s)(30) are/is normalized with a time constant normalization factor.

5

6. Turbo decoding method according to claim 5,

characterized in that

time constant normalization factor is equal to one.

10   7. Turbo decoding method to claim 5 ~~or 6,~~

characterized in that

only decoding units (30) being provided with a normalized output of a preceding decoding unit (25) are normalized with a time constant normalization factor.

15   8. Turbo decoding method according to ~~anyone of~~ claims 5 ~~to 7,~~

characterized in that

two decoding units (25, 30) are used, wherein the first decoding unit (25) is normalized (27) with a normalization factor variable during operation and the second decoding unit (30) is normalized with a time constant normalization factor.

20

9. Turbo decoding method according to ~~anyone of~~ claims 5 ~~to 8,~~

characterized in that

the normalization factors are calculated on the basis of the means and variance of the extrinsic information produced by the associated decoding unit.

25

10. Turbo decoding method according to ~~anyone of~~ claims 5 ~~to 9,~~

characterized in that

it is performed as a parallel concatenated scheme.

30